

Carnegie Centenary Professors since 2001

2018

Professor David Dunson, Arts & Sciences Distinguished Professor, Duke University

Host University University of Edinburgh

Profile Bayesian statistical and data science methods motivated by complex applications. Ongoing methodologic research focuses on nonparametric Bayes, latent structure learning, big data, scalable Bayesian inferences, machine learning, and high-dimensional low sample size problems. An emphasis is on approaches for learning low-dimensional structure underlying high-dimensional "objects" (images, surfaces, shapes, text, arrays, networks) with uncertainty quantification. This work involves inter-disciplinary thinking at the intersection of statistics, mathematics and computer science. Motivation comes from applications in epidemiology, environmental health, neurosciences, genetics, fertility and other settings (music, fine arts, humanities).

Professor Leo Hollberg, Professor of Physics, Stanford University

Host University University of Strathclyde

Profile Professor Hollberg's research objectives include high precision tests of fundamental physics as well as applications of laser physics and technology. This experimental program in laser/atomic physics focuses on high-resolution spectroscopy of laser-cooled and -trapped atoms, non-linear optical coherence effects in atoms, optical frequency combs, optical/microwave atomic clocks, and high sensitivity trace gas detection. Frequently this involves the study of laser noise and methods to circumvent measurement limitations, up to, and beyond, quantum limited optical detection. Technologies and tools utilized include frequency-stabilized lasers and chip-scale atomic devices. Based in the Hansen Experimental Physics Laboratory (HEPL), this research program has strong, synergistic, collaborative connections to the Stanford Center on Position Navigation and Time (SCPNT). Research directions are inspired by experience that deeper understanding of fundamental science is critical and vital in addressing real-world problems, for example in the environment, energy, and navigation. Amazing new technologies and devices enable experiments that test fundamental principles with high precision and sometimes lead to the development of better instruments and sensors. Ultrasensitive optical detection of atoms, monitoring of trace gases, isotopes, and chemicals can impact many fields. Results from well-designed experiments teach us about the "realities" of nature, guide and inform, occasionally produce new discoveries, frequently surprise, and almost always generate new questions and perspectives.

2017

Professor Claire Kramersch, Professor of German and Education, UC Berkeley

Host University University of Stirling

Profile Claire Kramersch is originally French, studied German at the Sorbonne and emigrated to the U.S. in 1963. After teaching German at M.I.T for 25 years, she moved to UC Berkeley, where she founded the Berkeley Language Center, a research and resource center for all foreign language teachers at Berkeley, and where she taught Applied Linguistics in the German department and in the Graduate School of Education. She is now Professor of the Graduate School. Her domain of research is second language acquisition, multilingualism and ecological approaches to the study of language and language use.

Professor Kramersch is the author of *Context and Culture in Language Teaching* (OUP 1993), *Language and Culture* (OUP 1998), *The Multilingual Subject* (OUP 2009), editor of

Language Acquisition and Language Socialization: Ecological perspectives (Continuum 2002) and co-editor of *The Multilingual Challenge* (de Gruyter 2014). In 1998, she received the Goethe Medal from the Goethe Institute for building cross-cultural bridges between Germany and the U.S., and was twice awarded the Mildenerger Award from the Modern Language Association. She is past president of the American Association for Applied Linguistics (AAAL), past editor of the journal *Applied Linguistics*, and current president of the International Association of Applied Linguistics (AILA).

Professor Elizabeth Thompson, Professor of Statistics, Biostatistics and of Genome Sciences, University of Washington

Host University University of St Andrews

Profile Elizabeth Thompson is Professor of Statistics, Biostatistics and of Genome Sciences at the University of Washington. She received her B.A. in mathematics and Ph.D. in mathematical statistics from Cambridge University, UK and then did postdoctoral work in the Department of Genetics, Stanford University, before taking up a faculty position at the University of Cambridge in 1976.

Professor Thompson joined the Statistics Department, University of Washington in December 1985, and served as Chair 1989-1994, and again 2011-2014. Dr. Thompson's research is in the development of methods for model-based likelihood inference from genetic data, particularly from data observed on large and complex pedigree structures both of humans and of other species, and including inference of relationships among individuals and among populations. Dr. Thompson is a recipient of a D.Sc. degree from the University of Cambridge, the Jerome Sacks award for cross-disciplinary research from the National Institute for Statistical Science, the Weldon Prize for contributions to Biometric Science from Oxford University, and of a Guggenheim fellowship. She is currently President-elect of the International Biometric Society, an honorary fellow of Newnham College, Cambridge, an elected member of the International Statistical Institute, the American Academy of Arts and Sciences, and the US National Academy of Sciences.

2016

Professor Douglas N. C. Lin, Professor of Astronomy and Astrophysics, University of California, Santa Cruz

Host University University of St Andrews

Profile Professor Lin's principal research interests are in the origin of the solar system, star formation, astrophysical fluid dynamics, dynamics of stellar clusters, structure of galaxies, active galactic nuclei, and galaxy formation. With graduate student Kim Supulver, Lin is currently involved in experiments to determine the necessary conditions for cohesive collisions in the context of growth of meteoric aggregates. He has developed a comprehensive theory for the structure and evolution of the primordial solar nebula and carried out extensive numerical simulations to study the growth of planetesimals and gas accretion by protoplanets. Currently, Lin and graduate student Geoff Bryden are engaged in an in-depth analysis of the effects of thermal convection, surface irradiation, infall, and warp on protostellar disks. These analyses are also applied to theories of accretion disks in the context of interacting binary stars and active galactic nuclei. Lin is currently formulating an extensive scenario for the formation of massive black holes in active galactic nuclei as well as the formation and evolution of gaseous accretion disks around them.

Another area of Lin's research is development of a theory for the formation of first-generation stars in globular clusters and galaxies. Lin's main objective is to identify the

important physical processes that regulate the fragmentation and the initial mass function of protostellar objects. With former graduate student Stephen Murray, Lin is formulating the first physical model that can provide a quantitative estimate for the rate of star formation in a collapsing protogalactic cloud. This scenario is also applied to study the formation of globular clusters.

In the context of stellar dynamics, Lin is investigating the tidal disruption of satellite dwarf galaxies in the Local Group. In close collaboration with observational colleagues Burton Jones and Arnold Klemola, Lin is evaluating the extent of the galactic halo from the proper motion of the Magellanic Clouds. They are also examining the possibility that the satellite dwarf galaxies may be the debris of tidal interaction between the Magellanic Cloud and the Milky Way.

Professor Geoffrey Parker, Distinguished University Professor and Andreas Dorpalen Professor of European History, Ohio State University

Host University University of St Andrews

Profile Geoffrey Parker is one of the great living scholars in the Humanities and a towering figure in early modern European history, with a special interest in military history and its implications for international relations.

His first job on leaving Cambridge was at St Andrews, where he stayed for a number of years before he was head-hunted to be Charles E. Nowell Distinguished Professor of History, University of Illinois at Urbana-Champaign; he then moved to the chair of military history at Yale. Along the way, he became a fellow of the British Academy, at the exceptionally young age of 40, and has gone on to pick up multiple awards and recognitions, including fellowships of highly selective national academies across continental Europe.

Perhaps the most impressive recognition was the biennial Heineken Foundation Prize for History in 2012, this prestigious award the closest that a historian can get to a Nobel Prize. His academic esteem is matched by the wider notice that his work has attracted. He writes highly readable prose for educated general audiences and his books attract consistently favourable, sometimes incandescent praise from reviewers inside and outside academe, including his recent magisterial survey of climate change and global history.

Professor Cornelia M Weyand, Professor of Medicine, Stanford University

Host University University of Glasgow

Profile Professor Cornelia Weyand is an outstanding clinician, scientist, teacher and leader in biomedical research and is internationally recognised as a world leader in immunity, inflammation and its direct contribution to vascular disease.

Professor Cornelia Weyand is the Chief of the Division of Immunology and Rheumatology at Stanford University School of Medicine. Professor Weyand previously directed the Clinical Immunology and Immunotherapeutics Program in the Department of Medicine at the Mayo Clinic and held the David C. Lowance Chair in Medicine at Emory University. She has had a special interest in tissue-damaging immune responses in rheumatoid arthritis, atherosclerosis and large vessel vasculitis. She has established several preclinical models, including a chimera model in which human synovial tissue and human blood

vessels are engrafted into immunodeficient mice. In these model systems, Professor Weyand's research team has defined the role of T cells and dendritic cells in deviating from protective to destructive immunity. Over the last decade, she has focused on how the immune system remodels with ageing, how chronic disease ages the immune system, and how aged immune cells cause inflammation. More recently she has worked on the role of the immune system in vascular inflammation, and has identified and characterized immune cells that mediate vasculitis and has thereby defined the molecular underpinnings of the immuno-stromal interactions that cause arterial inflammation. This seminal work has opened the field and there is now extensive research on the immune system, inflammation and vascular disease.

2015

Professor James C. Coyne, Director Behavioral Oncology Program, Abramson Cancer Center and Professor of Psychology, Department of Psychiatry, University of Pennsylvania School of Medicine

Host University University of Stirling

Profile Major Depression and anxiety disorders tend to be overlooked and inadequately treated in cancer patients, and their risk can extend into survivorship. The team has been documenting the extent of the problem of untreated and inadequately treated depression and anxiety and developing ways of ensuring better treatment and follow up. The team is working to redesign methods of psychosocial intervention in order to better accommodate the needs, abilities, and desires specific to cancer patients and survivors out in the community. More recently, the group has begun examining ways of addressing the disadvantage of men without partners in the adherence to and outcome of treatment of cancer, a disadvantage apparently not shared by women without partners.

In addition to his appointments at the University of Pennsylvania, School of Medicine, Dr. Coyne is an adjunct professor of Health Psychology at the University of Groningen. He received his B.A. from Carnegie-Mellon University and his Ph.D. in clinical psychology from Indiana University. He served on the faculty of Miami University and, then, the University of California, Berkeley. After completing a fellowship in the social environment and health program of the Institute for Social Research (ISR), University of Michigan, he remained as a faculty associate of ISR and joined the faculty of the Department of Family Medicine and Department of Psychiatry at the University of Michigan. While at Michigan, he was also a senior investigator in behavioral sciences research at the University of Michigan Comprehensive Cancer Center. In citation analyses, Dr. Coyne consistently ranks in the top 200 of all North American psychologists for impact of his work. He has served on many editorial boards across disciplines and has been an ad hoc member of numerous NIH study sections and advisory boards. He is as been elected a fellow of the American Psychological Association, Society of Behavioral Medicine, and Academy of Behavioral Medicine Research.

Professor Richard Ellis, Steele Professor of Astronomy, California Institute of Technology

Host University University of Edinburgh

Profile Professor Richard Ellis is a distinguished astronomer with a long track record of major discoveries in many fields and is one of the world's most cited scientists.

Within the UK he played a pioneering role in opening up the distant universe to direct observation. In his early career he demonstrated the promise of many of the key tools of contemporary cosmology (distant supernovae, large scale structure and gravitational

lensing) and contributed significantly to the development of new instrumental facilities for the UK community.

Within the US, Ellis has exploited the twin Keck telescopes and the Hubble Space Telescope to explore the earliest period of cosmic history when the Universe was less than a billion years old. He developed the science case and the international partnership for the US-led Thirty Meter Telescope, an ambitious next generation facility now under construction.

Ellis was Head of Astronomy at Durham University from 1985-1993, Plumian Professor and Director of the Institute of Astronomy, Cambridge from 1994-1999 and Director of Caltech Optical Observatories from 2000-2006. He has received many awards for his outstanding leadership and scientific contributions including the Gruber Cosmology Prize (for his part in the discovery of the accelerating Universe), the Royal Astronomical Society Gold Medal (for a lifetime contribution to astronomy) and the award of Commander of the British Empire (for contributions to international science).

Professor Graham Farquhar, Professor of Biology, Australian National University

Host University University of Glasgow

Profile Distinguished Professor Graham Farquhar has undertaken and led research across a broad range of fields and scales, from the molecular and isotopic composition of plants to global environmental change. He has over 300 research publications and is a leading Citation Laureate. He is a fellow of The Australian Academy of Science, the Royal Society (London), and Foreign Associate of the National Academy of Sciences (USA).

Graham has received honorary doctorates from the Universities of Wageningen, Antwerp, professorships from the Chinese Academy of Sciences, and numerous awards, including the Peter Baume Award (Australian National University), Officer of the Order of Australia, the Rank Prize (UK), and the Alexander von Humboldt award (Germany). He has served in various capacities internationally, including as a scientific advisor and Australian representative to the Kyoto Framework Convention, and he is honoured with the shared Nobel Peace Prize (2007) as a member of the Intergovernmental Panel on Climate Change.

Graham earned a BSc from Australian National University in 1968, a BSc with Honours in Biophysics from University of Queensland in 1969, and a PhD from Australian National University in 1973. He undertook research at the Department of Energy laboratories of Michigan State University before returning to Australia in 1976. He has researched for more than 40 years across a range of fields and scales, from the cellular to the field. He is one of a relatively small number of plant scientists who brings to his research a background in both physics and biology.

Graham's interests include photosynthesis, its interactions with nitrogen and water use of plants, stomatal physiology and their impact on global environmental change. His efforts in the 1980's led to some of the first quantitative models of CO₂ and transpirative gas exchange from plants in the field, still widely cited in the literature and used as a benchmark in the field. More recently his research has included development of Drysdale, a water-efficient strain of wheat.

Professor Brett Finlay, Professor of Biochemistry and Molecular Biology, and Microbiology and Immunology, University of British Columbia

Host University University of Glasgow

Profile Brett Finlay is a Professor in the Michael Smith Laboratories, and the Departments of Biochemistry and Molecular Biology, and Microbiology and Immunology at the University

of British Columbia. He obtained a B.Sc. (Honors) in Biochemistry at the University of Alberta, where he also did his Ph.D. (1986) in Biochemistry under Dr. William Paranchych, studying F-like plasmid conjugation. His post-doctoral studies were performed with Dr. Stanley Falkow at the Department of Medical Microbiology and Immunology at Stanford University School of Medicine, where he studied Salmonella invasion into host cells.

In 1989, he joined UBC as an Assistant Professor in the Biotechnology Laboratory. Dr. Finlay's research interests are focussed on host-pathogen interactions, at the molecular level. By combining cell biology with microbiology, he has been at the forefront of the emerging field called Cellular Microbiology, making several fundamental discoveries in this field, and publishing over 300 papers. His laboratory studies several pathogenic bacteria, with Salmonella and pathogenic E. coli interactions with host cells being the primary focus.

He is well recognized internationally for his work, and has won several prestigious awards including the E.W.R. Steacie Prize, the CSM Fisher Scientific Award, a MRC Scientist, five Howard Hughes International Research Scholar Awards, a CIHR Distinguished Investigator, BC Biotech Innovation Award, the Michael Smith Health Research Prize, the IDSA Squibb award, the Jacob Biely Prize, is a Fellow of the Royal Society of Canada and the Canadian Academy of Health Sciences, an Officer of Canada and awarded the Order of BC, and is the UBC Peter Wall Distinguished Professor. He is a Director of the SARS Accelerated Vaccine Initiative. He also serves on several editorial and advisory boards, and is a strong supporter of communicating science to the public.

2014

Professor David Battisti, Professor of Atmospheric Sciences, and Tamaki Endowed Chair, University of Washington, Seattle

Host University University of Edinburgh

Profile David received a Ph.D. in Atmospheric Sciences (1988) from the University of Washington. He was an Assistant Professor at the University of Wisconsin until 1990. Since then, he has been on the Faculty in the Department of Atmospheric Sciences at the University of Washington, and has served as the Director of JISAO (1997-2003) and of the UW's Earth Initiative (2003-2006).

Battisti's research is focused on understanding the natural variability of the climate system. He is especially interested in understanding how the interactions between the ocean, atmosphere, land and sea ice lead to variability in climate on time scales from seasonal to decades. His previous research includes coastal oceanography, the physics of the El Nino/Southern Oscillation (ENSO) phenomenon, midlatitude atmosphere/ocean variability and variability in the coupled atmosphere/sea ice system in the Arctic. Battisti is presently working to improve the El Nino models and their forecast skill, to understand the mechanisms responsible for the drought cycles in the Sahel, and to better understand the monsoons. He is also working on the impacts of climate variability and climate change on food production in Mexico, Indonesia and China.

Battisti's recent interests are in paleoclimate: in particular, the mechanisms responsible for the remarkable "abrupt" global climate changes evident throughout the last glacial period.

Battisti has served on numerous international science panels, on Committees of the National Research Council. He served for five years as co-chair of the Science Steering

Committee for the U.S. Program on Climate (US CLIVAR) and is co-author of several international science plans. He has published over 90 papers in peer-review journals in atmospheric sciences and oceanography, and twice been awarded distinguished teaching awards.

Professor Eric Richards, Emeritus Professor of History, Flinders University, Australia

Host University University of the Highlands and Islands

Profile He has held visiting positions at the Australian National University and in several universities in Britain and the United States. He is a Fellow of the Academy of the Social Sciences in Australia, and also of the Australian Academy of the Humanities, 1986.

He publishes widely on British history, and his books on the Highland Clearances have won prizes in Scotland. He is also author and editor of a range of books on migration history, notably his broad survey: *Britannia's Children: Emigration from England, Scotland, Wales and Ireland since 1600* (2004). His *Destination Australia: Migration to Australia since 1901* (UNSW Press, Sydney, 2008), won a New South Wales Premier's Literary Award, 2009. His recent publications include: *The Highland Clearances; People, Landlords and Rural Turmoil* (Edinburgh, Birlinn, 2013) and an edited collection, *On the Wing: Mobility before and after Emigration to Australia*, (Sydney, Anchor Press, 2013).

In 2014 he will be Carnegie Trust Centenary Professor at the new University of the Highlands and Islands, based at Dornoch and Inverness. He is currently working on the genesis of modern international migration and on Highland history. He is a keen tennis player and cyclist.

2013

Professor David A.B. Miller, W. M. Keck Foundation Professor of Electrical Engineering, Stanford University

Host University University of Strathclyde

Profile David Miller received a B. Sc. in Physics from St. Andrews University, and performed his graduate studies at Heriot-Watt University where he was a Carnegie Research Scholar. After receiving the Ph. D. degree in 1979, he continued to work at Heriot-Watt University, latterly as a Lecturer in the Department of Physics. He moved to AT&T Bell Laboratories in 1981 as a Member of Technical Staff, and from 1987 to 1996 was a Department Head, latterly of the Advanced Photonics Research Department. He is currently the W. M. Keck Foundation Professor of Electrical Engineering at Stanford University, and a Co-Director of the Stanford Photonics Research Center. He also served as the Director of the E. L. Ginzton Laboratory at Stanford University from 1997-2006.

His research interests include the use of optics in switching, interconnection, communications, computing, and sensing systems, physics and applications of quantum well optics and optoelectronics, and fundamental features and limits for optics and nanophotonics in communications and information processing. He has published over 250 technical papers including 13 book chapters, a text book *Quantum Mechanics for Scientists and Engineers*, delivered over 160 conference invited talks and over 40 short courses, and holds 69 patents. He has an h-index of 68.

He has been a member or chair of over 40 technical conference committees, and was General Co-Chair for the Conference on Lasers and Electro-Optics in 1996. He has been elected to the Boards of both the Institute of Electrical and Electronics Engineers (IEEE) Lasers and Electro-Optics Society (LEOS) and the Optical Society of America (OSA), was a member of the Defense Sciences Research Council for the Defense Advanced Research Projects Agency from 1991-2005, and also served on several scientific journal editorial boards. He was President of the IEEE Lasers and Electro-Optics Society in 1995. He also has served on boards for several photonics companies.

He is a Member of the National Academy of Sciences and of the National Academy of Engineering, a Fellow of the Royal Society of London, the Royal Society of Edinburgh, the IEEE, the Optical Society of America and the American Physical Society, and was awarded the Doctor Honoris Causa by the Vrije Universiteit Brussel and an honorary Doctor of Engineering from Heriot-Watt University. For his work on semiconductor nonlinear optics, quantum well optical properties, and novel devices, he was awarded the 1986 Adolph Lomb Medal of the OSA, was co-recipient of the 1988 R. W. Wood Medal, and received the 1991 Prize of the International Commission for Optics. He was also an IEEE Lasers and Electro-Optics Society Traveling Lecturer in 1986-87. He was awarded an IEEE Third Millennium Medal in 2000, and the Carnegie Centenary Professorship in 2013.

2012

Professor Lloyd Humberstone, School of Philosophical, Historical and International Studies, Faculty of Arts, Monash University Australia

Host University University of St Andrews

Profile Educated at the Universities of York and Oxford, Professor Humberstone was first appointed at Monash University in 1975. Author of over 100 articles on logic and philosophy, his magnum opus, *The Connectives*, running to nearly 1500 pages, was published by MIT Press in 2011. This work examines the semantics and pragmatics of natural language sentence connectives ('and', 'or', 'if', 'not'), giving special attention to their formal behaviour according to proposed logical systems and the degree to which such treatments capture their intuitive meanings.

2011

Professor Keith Rayner, Director of the Rayner Eyetracking Lab, Atkinson Professor of Psychology, University of California, San Diego

Host University University of Dundee

Awards & Prizes 2010 Chancellor's Associates Research Award, University of California, San Diego
2009 Alexander Von Humboldt Foundation Research Award
2007 Bartlett Lecture, Lifetime Achievement Award from Experimental Psychology Society
2006 Chancellor's Lifetime Achievement Award, University of Massachusetts
2003 Elected Member, Society of Experimental Psychology
2001-02 Leverhulme Visiting Professor, University of Durham
1996 Outstanding Scientist Award, Society for the Scientific Study of Reading
1991-92 Faculty Fellowship, University of Massachusetts

Profile Professor Rayner is Atkinson Professor of Experimental Psychology at the University of California, San Diego, and has been one of the world's foremost researchers in cognitive

psychology for over 30 years. His work has had a major impact on educationalists and vision scientists and he has received numerous prestigious awards and acted on the editorial board of a large number of important international.

Professor Don Garrett, Professor of Philosophy, New York University

Host University University of Edinburgh

Specialisms Early modern philosophy, with special interests in metaphysics, epistemology, philosophy of mind, and ethics

Profile (Ph.D., Yale), came to NYU in 2003 from the University of North Carolina at Chapel Hill, where he was Kenan Distinguished Professor for Teaching Excellence. He has also taught at Harvard University, Johns Hopkins University, and the University of Utah. He works primarily in early modern philosophy, with special interests in metaphysics, epistemology, philosophy of mind, and ethics. He is the author of *Cognition and Commitment in Hume's Philosophy* (Oxford University Press, 1997) and *Hume* (Routledge, forthcoming) and the editor of *The Cambridge Companion to Spinoza* (Cambridge University Press, 1996). He has served as co-editor of *Hume Studies* and as North American editor of *Archiv für Geschichte der Philosophie*. He was elected to the American Academy of Arts and Sciences in 2009 and was Carnegie Centenary Professor at the University of Edinburgh in 2011.

2010

Professor George Galster, Clarence Hilberry Prof. of Urban Affairs at Wayne State University, Detroit

Host University University of Glasgow

Awards & Prizes 2013 Penn Institute for Urban Research Scholar; University of Pennsylvania
2012 Distinguished Faculty Fellowship, Wayne State University
2006 Community Economic Development Award for Outstanding Scholarship, Michigan State University
2005 Wibaut Fellowship for Distinguished Scholar, University of Amsterdam
1998 Floyd McKissick Distinguished Scholar, U. of North Carolina-Chapel Hill
1998 Inducted Fellow, Homer Hoyt Institute of Advanced Real Estate Studies
1985 Luce Grant for Distinguished Scholarship, College of Wooster
1971 74 NDEA Title IV Fellowship, MIT
1969 Presidential Scholarship, Wittenberg University

Profile George Galster has published over 130 peer-reviewed articles and 30 book chapters on topics ranging from metropolitan housing markets, racial discrimination and segregation, neighbourhood dynamics, residential reinvestment, community lending and insurance patterns, neighbourhood effects, and urban poverty. His eight authored, co-authored, and edited books include *Homeowners and Neighborhood Reinvestment*, 1987; *The Maze of Urban Housing Markets*, 1991; *The Metropolis in Black and White*, 1992; *Reality and Research: Social Science and American Urban Policy since 1960*, 1996; *Why NOT in My Back Yard?: The Neighborhood Impacts of Assisted Housing*, 2003; *Life in Poverty Neighborhoods*, 2005; *Frontiers of Quantifying Neighborhood Effects*, 2008; and *Driving Detroit: The Quest for Respect in the Motor City*, 2012.

Dr. Galster provides a wealth of experience in academic, governmental, non-profit, and for-profit circles. He has been a consultant to the U.S. Department of Housing and Urban

Development, U. S. Department of Justice, numerous municipalities, community organizations, civil rights groups, and organizations like the National Association of Realtors, American Bankers Association, Fannie Mae, and Chemical Bank Corporation. He has served on the Consumer Advisory Council of the Federal Reserve's Board of Governors, National Academy of Science review committees, and numerous other leadership positions in community service. He has provided housing policy consultations to public officials in Australia, Canada, China, Scotland, and the U.S.

Dr. Galster has held positions at the Universities of: Harvard, Berkeley, North Carolina, Amsterdam, Delft, Glasgow, Mannheim, Oslo, and Western Sydney, among others. He served as Director of Housing Research at the Urban Institute in Washington, DC before coming to Wayne State University in 1996.

Professor Emerita Julie Cruickshank, Dept. of Anthropology & Sociology, University of British Columbia

Host University University of Aberdeen

Awards & Prizes 2007 Clio Award (The North), for *Do Glaciers Listen?: Local Knowledge, Colonial Encounters and Social Imagination*. Awarded by the Canadian Historical Association.
2006 Victor Turner Prize in Ethnographic Writing for *Do Glaciers Listen?* (Society of Humanistic Anthropology), American Anthropological Association.
2006 Julian Steward Book Award, for *Do Glaciers Listen? Anthropology and Environment* Section, American Anthropological Association.
2005 K.D. Srivastava for *Do Glaciers Listen?* Awarded by UBC.
2001-2003 Brenda and David McLean Chair in Canadian Studies, 2001-2003.
1995 Robert F. Heizer Prize, awarded by the American Society for Ethnohistory, for paper "Claiming Legitimacy: Prophecy Narratives from Northern Aboriginal Women."
1995 UBC Prize for Excellence in Teaching, Faculty of Arts.
1994 UBC Izaak Walton Killam Memorial Faculty Research Fellowship.
1992 UBC Killam Research Prize.
1991 Sir John A. Macdonald Prize, for *Life Lived Like a Story*, awarded by the Canadian Historical Association.

Specialisms Oral tradition studies; anthropology of memory and environmental anthropology

Profile Julie Cruickshank is Professor Emerita in the Department of Anthropology at the University of British Columbia where she also held the McLean Chair in Canadian Studies, 2001-2003. For more than a decade, she lived in the Yukon Territory where she worked with the Yukon Native Language Centre recording oral traditions and life stories with Athapaskan and Tlingit elders. She has also conducted research in Alaska and Siberia. Her research interests include environmental anthropology, circumpolar political developments and approaches to analysis of oral tradition.
Her books include *Life Lived Like a Story* (1990, written in collaboration with three Yukon elders, Angela Sidney, Annie Ned and Kitty Smith, and winner of the Canadian Historical Association's 1991 MacDonald Prize); *Reading Voices* (1991), and *The Social Life of Stories* (1998). Her recent book, *Do Glaciers Listen? Local Knowledge, Colonial Encounters and Social Imagination* (2005) received two book prizes from the American Anthropological Association - the Victor Turner Prize and the Julian Steward Book Award. She has also published papers in a number of scholarly journals - *American Anthropologist*, *Ethnohistory*, *Anthropology Today*, *Arctic Anthropology*, *American Indian*

Quarterly, Culture, B.C. Studies and other journals. She was awarded the Robert F. Heizer Prize by the American Society for Ethnohistory in 1995. Other research awards have included a UBC Killam Research Prize (1992) and a UBC Izaak Walton Killam Memorial Faculty Research Fellowship (1994). She received a UBC Prize for Excellence in Teaching from the Faculty of Arts in 1995.

2009

Professor James Gimzewski, Clarence Professor of Chemistry, University of California, LA

Host University University of Strathclyde

Awards & Prizes

- 2009 Elected Fellow of The Royal Society, UK
- 2008 Dr. Honoris Causa, Université de la Méditerranée, Aix-Marseille II, presented by the Ministry of Foreign Affairs, France.
- 2007 Benajamin Meaker Visiting Professorship, Department of Physics, Bristol University,
- 1985 IBM First Patent Application Award
- 2004 Elected Member of the International Society for Nanoscale Science, Computation and Engineering
- 2002 Elected Fellow of the World Innovation Foundation
- 2002 Elected co-director of Center for Social Interfaces & Networks Advanced Programming Simulations & Environments (SINAPSE), UCLA
- 2001 Elected Fellow Royal Academy of Engineering (REng)
- 2001 Dudell Medal and Prize for contribution to Nanoscale science, Institute of Physics
- 2000 IBM Sixth Invention Achievement Plateau Award
- 1997 Awarded the 1997 Feynman Prize in Nanotechnology for Experimental Work
- 1997 The Discover Award for Emerging Fields (Nanotechnology)
- 1997 Awarded status of 'Founder' of the Institute of Nanotechnology
- 1997 IBM Fifth Invention Achievement Plateau Award
- 1997 IBM Outstanding Innovation Award in appreciation for Engineering Single Molecules
- 1996 Invited STA Fellow National Institute for Metals (NRIM), Japan
- 1995 Elected Fellow of the Institute of Physics (FinstP)
- 1995 Awarded title of Chartered Physicist (CPhys)
- 1994 IBM Fourth Invention Achievement Plateau Award
- 1992 IBM Research Division Group Award in Appreciation of Construction and Operation of a Low Temperature UHV STM
- 1992 IBM Third Invention Achievement Plateau Award
- 1989 IBM Outstanding Innovation Award in appreciation for Local Experiments and Local Photoemission in Scanning Tunneling Microscopy
- 1987 IBM Second Invention Achievement Plateau Award
- 1986 IBM First Invention Achievement Plateau Award

Specialisms Nanotechnology applications to cancer research

Profile Jim Gimzewski is a Distinguished Professor of Chemistry at the University of California, Los Angeles; Director of the Nano & Pico Characterization Core Facility of the California NanoSystems Institute; Scientific Director of the Art|Sci Center and Principal Investigator and Satellites Co-Director of the WPI Center for Materials NanoArchitectonics (MANA) in Japan. Prior to joining the UCLA faculty, he was a group leader at IBM Zurich Research Laboratory, where he research in nanoscale science and technology for more than 18 years. Dr. Gimzewski pioneered research on mechanical and electrical contacts with

single atoms and molecules using scanning tunneling microscopy (STM) and was one of the first persons to image molecules with STM. His accomplishments include the first STM-based fabrication of molecular suprastructures at room temperature using mechanical forces to push molecules across surfaces, the discovery of single molecule rotors and the development of new micromechanical sensors based on nanotechnology, which explore ultimate limits of sensitivity and measurement. This approach was recently used to convert biochemical recognition into Nanomechanics. His current interests are in the nanomechanics of cells and bacteria where he collaborates with the UCLA Medical and Dental Schools. He is involved in projects that range from the operation of X-rays, ions and nuclear fusion using pyroelectric crystals, direct deposition of carbon nanotubes and single molecule DNA profiling. Dr. Gimzewski is also involved in numerous art-science collaborative projects that have been exhibited in museums throughout the world.

2009

Professor Lee Fontanella, Emeritus Professor, Worcester Polytechnic Institute, Massachusetts

Host University University of Stirling

Specialisms Spanish language and literature, history of photography, and comparative literature.

Profile Professor Lee Fontanella is an American expert on photography and visual culture. He was Head of Humanities and Arts at Worcester Polytechnic Institute, and was previously Professor and Chair at the University of Texas, Austin. He has served as a consultant on photography in Spain in several of the best museums in the world: Victoria & Albert, Getty, Canadian Centre for Architecture, Metropolitan NY, as well as many in Spain. The author of 14 books on photography and other academic subjects, he has a particular interest in early photography, and the photographic works of British travellers to Spain. His seminal history of Spanish photography was awarded national and international prizes, and the Queen of Spain selected one of his publications as a gift to guests on the occasion of the wedding of the Infanta of Spain in 1995. He is also the screenwriter of the movie, *The Gray Man*, which premiered at the Montreal Film Festival in 2007.

2008

Professor Witold Nazarewicz, Professor of Physics, University of Tennessee

Host University University of the West of Scotland

Profile/ Specialisms Dr. Witold Nazarewicz is a Professor of Physics at both the University of Tennessee and Warsaw University, Poland. He is also a Distinguished R & D Staff at the Oak Ridge National Laboratory's Physics Division. He is also a member of the Joint Institute for Heavy Ion Research directorate. During 1999-2012 he served as the Scientific Director of the ORNL Holifield Radioactive Ion Beam Facility. He has held several visiting positions, including professorships at Lund University, the University of Cologne, Kyoto University, and the University of Liverpool.

Dr. Nazarewicz is a Fellow of the American Physical Society, the U.K. Institute of Physics, and the American Association for the Advancement of Science. He received an Honorary Doctorate from University of the West of Scotland in 2009; was awarded the 2012 Tom W. Bonner Prize from the American Physical Society and was named the 2012 Oak Ridge National Laboratory's Distinguished Scientist.

Dr. Nazarewicz is the author of nine review papers and more than 350 refereed publications in scientific journals. With 15,000 citations and h-index 70, he is listed by ISI

among the most highly-cited physicists. He has also made more than 150 contributions to major conferences, published in their respective proceedings. He has given 220 invited talks at major international conferences and more than 250 invited seminars and colloquia. Dr. Nazarewicz has helped organize more than 60 meetings and conferences and presently serves on 14 professional committees and editorial boards.

Dr Rodney Goodman, Chief Technology Officer of InfID Technologies Inc.

Host University: University of Edinburgh

Profile/ Specialisms From 1975 to 1985 Dr. Goodman was a member of the faculty of the Department of Electrical and Electronic Engineering at the University of Hull, UK. In 1985 he joined the faculty of the California Institute of Technology where he was Professor of Electrical Engineering until September 2001. Dr. Goodman left Caltech to focus on his entrepreneurial activities, taking up the position of Vice President of Nano-Technology at Cyrano Sciences, the electronic nose company, of which he was a founder (now a division of Smiths Detection). Currently, Dr Goodman is Chief Technology Officer of InfID Technologies Inc., an RFID solutions company, and is President of Gaea Corporation, an R&D consulting company. He is also a Board Member and Consultant to several other advanced technology start-up companies in the Pasadena area.

Dr. Goodman's current research interests are in intelligent information processing systems, electronic nose technology, distributed communications networks of sensors and actuators, ultra wideband wireless, ad-hoc networks, RFID and RTLS. In addition, novel control architectures for multiple autonomous mobile robots, and machine consciousness are being pursued.

Dr. Goodman was the founding PI of the National Science Foundation's Center for Neuromorphic Systems Engineering at Caltech, and served as its director for the first two years of operation, and as director of industrial liaison thereafter. These are national centers of excellence, and the Caltech Center for Neuromorphic Systems Engineering is at the forefront of this field. The mission of this center is to develop the technologies necessary for endowing the machines of the future with the human-like senses of vision, audition, touch, and smell and taste (chemical sensing), and applying these to autonomous robots.

Dr. Goodman has consulted for a variety of government and commercial organizations in both the US and the UK. He is a founder of five advanced technology research and development companies in both the US and the UK, and is currently a consultant to several high technology companies in the Pasadena area.

Dr. Goodman is a Fellow of the IEEE, and a Chartered Electrical Engineer and Fellow of the IEE. His honors and awards include two NATO Senior Scientist Awards and a Research Fellowship of the Royal Society. Dr Goodman has served as North American editor of Neural Computing and Applications, and has served as a reviewer for various IEEE (U.S.A.), and IEE and IERE (U.K.) journals including: IEEE Transactions on Information Theory, Computers, Neural Networks, Pattern Analysis and Machine Intelligence, Proceedings of the IEEE, Proceedings of the IEE, Electronics Letters, and Neural Computation. Dr Goodman has served on various organizing and program committees for: IEEE International Information Theory Symposium, Neural Information Processing Systems (NIPS), NIPS Foundation, International Joint Conference on Neural Networks (IJCNN), Neural Networks for Computing/Machines that Learn (Snowbird), IFIP International Symposium on Integrated Network Management (ISINM), International

Symposium of Circuits and Systems (ISCAS), International Workshop on Applications in Neural Networks in Telecommunications (IWANNT), Frontiers in Distributed Information Systems (FDIS), and the International Workshop on “ Can a Machine be Conscious ”, Cold Spring Harbor. Dr. Goodman has published over 150 technical papers and patents in his areas of expertise.

2007

Professor William I Miller, Thomas G Long Professor of Law, University of Michigan

Host University University of St Andrews

Specialisms Icelandic Sagas; Medieval History; Social and Political Theory; Emotions; Vices and Virtues

Profile William I. Miller, the Thomas G. Long Professor of Law, has been a member of the Michigan Law faculty since 1984. Originally, his research centered on saga Iceland, from whence the materials studied in his blood feuds class and his book, *Bloodtaking and Peacemaking: Feud, Law, and Society in Saga Iceland* (1990). He has also written about emotions, mostly unpleasant ones involving self-assessment, and select vices and virtues. Thus his books: *The Mystery of Courage* (2000), *The Anatomy of Disgust* (1997), *Humiliation* (1993), and *Faking It* (2003), the last of which deals with anxieties of role, identity, and posturings of authenticity. *The Anatomy of Disgust* was named the best book of 1997 in anthropology/sociology by the Association of American Publishers. In *Eye for an Eye* (2006), he returns to matters of revenge and retribution in an extended treatment of the law of the talion. *Audun and the Polar Bear: Luck, Law, and Largesse in a Medieval Tale of Risky Business* (2008) is an extended treatment of a superbly crafted short Icelandic tale. His most recent book, *Losing It* (2011), about aging and decline, was named by the *Chicago Tribune* to its best books of the year list; *Macleans* magazine of Canada listed it in their top 10 non-fiction books of 2011. Presently Prof. Miller is writing a book on Njáls saga. He earned his BA from the University of Wisconsin and received both a PhD in English and a JD from Yale. He has also been a visiting professor at Yale, the University of Chicago, the University of Bergen, the University of Tel Aviv, and Harvard, and in 2008 was the Carnegie Centenary Trust Professor at the University of St. Andrews. He is now honorary professor of history at the University of St. Andrews.

2007

Professor Peter Hall, Australian Laureate Fellow, Australian National University

Host University The University of Glasgow

Awards & Prizes

- 2007 Gottfried E. Noether Senior Scholar Award, American Statistical Association
- 2007 Matthew Flinders Medal and Lecture, Australian Academy of Science
- 2006 Australian Federation Fellow, Australian Research Council
- 2003 Centenary Medal, Australian Government
- 2002 Australian Professorial Fellow, Australian Research Council
- 2002 Corresponding Fellow of the Royal Society of Edinburgh
- 2002 Award for an Outstanding Paper on Statistical Applications, American Statistical Association
- 2000 Fellow of the Royal Society of London
- 2000 Centennial Professorship (2000-2002), London School of Economics
- 1996 Fellow of the American Statistical Association
- 1994 Hannan Medal, Australian Academy of Science

1990 Pitman Medal, Statistical Society of Australia
 1989 Honorary Fellow of the Royal Statistical Society
 1989 Committee of Presidents of Statistical Societies Award, Institute of Mathematical Statistics
 1989 Lyle Medal, Australian Academy of Science
 1987 Fellow of The Australian Academy of Science
 1986 Fellow of The Australian Academy of Science, Royal Society of New South Wales
 1986 Rollo Davidson Prize, Cambridge University
 1986 Medal of the Australian Mathematical Society
 1984 Fellow of the Institute of Mathematical Statistics

Profile/ Specialisms

Professor Peter Hall is an Australian Research Council Federation Fellow and Professor of Statistics in the Department of Mathematics and Statistics at The University of Melbourne. Professor Hall is recognised as making a significant contribution to the field of statistics through his work on nonparametric modelling, probability theory, Bootstrap expansion, Edgeworth expansion, wavelets, ill-posed inverse problems, fractals-based methods and high-dimensional statistical learning. Professor Hall's research will be based around developing methodology for analysing complex, high dimensional data, with motivations that include elucidating the causes of diseases and providing better security for the community. His research will take statistical science in new directions as he develops new methods to tackle these difficult problems. Professor Hall completed his DPhil in the field of Probability Theory at the University of Oxford in 1976. He is currently an elected fellow of the Australian Academy of Science, the Royal Society of London, the Royal Society of Edinburgh, the American Statistical Association and the Institute of Mathematical Statistics. Professor Hall's contribution to Statistics has been recognised by receiving the George Szekeres Medal in 2010, which is awarded by the Australian Mathematical Society for his outstanding contribution to mathematical sciences. He has also received honorary doctorates from the Universite Catholique de Louvain, the University of Glasgow and the University of Sydney. Professor Hall has undertaken numerous leadership roles including serving as Vice-President of the Australian Academy of Science, President of the Institute of Mathematical Statistics, Chair of the Scientific Advisory Committee of the Australian Mathematical Sciences Institute, as a member of the International Advisory Committee for the Department of Business Statistics and Econometrics at Peking University, as President of the Australian Mathematical Society, as Secretary, Physical Sciences, and on the Advisory Board of the Institute for Applied Mathematics and Computational Science at King Abdullah University of Science and Technology.

2006

Professor Prasanta Pattanaik, Emeritus Professor of Economics, University of California, Riverside

Host University

University of Stirling

Awards & Prizes

2006-2007 Elected President of the Society for Social Choice and Welfare
 2004 Fellow of the Human Development and Capability Association
 2004 Fellow of the Public Choice Society
 2000 Honorary doctorate awarded by the University of Caen, France
 1991-93 President's Chair, University of California
 1986 Mahalanobis Memorial National Award, Indian Econometric Society.

1979 Fellow of the Econometrics Society

1965 Hira Lal Bhargava Prize, awarded by the University of Delhi to the highest ranking student among those receiving the M. A. degree in economics in any given year

Profile/ Specialisms Current research interests lie mainly in the areas of welfare economics and the theory of social choice, decision theory (including the theory of choice under uncertainty and the theory of fuzzy preferences), and the measurement of deprivation and the standard of living. Development economics and the methodology of economics.

Professor James A Piper, Physics, Macquarie University -Sydney, Australia

Host University Heriot-Watt University

Awards & Prizes 1997 AOS Medal, Australian Optical Society
1994 Fellow, Optical Society of America
1984 Walter Boas Medal, Australian Institute of Physics
1982 Pawsey Medal, Australian Academy of Science

Profile/ Specialisms Professor Piper has extensive expertise and experience gained over 30 years of research in lasers, optics and photonics, and applications in micro fabrication. In the area of gas lasers, he has a strong international reputation for research in continuous wave metal ion, cyclic pulsed metal vapour lasers and metal ion recombination lasers; outcomes include developments of new high-power copper vapour laser technologies of international importance due their application in a variety of industrial laser processes. Research on beam quality and nonlinear frequency conversion of high-power copper lasers has led development of new ultraviolet laser sources which also have important industrial applications in microfabrication. He has also undertaken extensive developments of tunable dye laser cavities, particularly for copper laser pumped dye lasers, work which has resulted in several widely cited publications which have formed the basis of many subsequent dye laser designs used commercially, and in various major national programs relating to the nuclear industry.

His research in solid-state lasers has concentrated primarily on diode-pumped lasers and related thermal engineering, mid-infrared solid state laser materials, solid state Raman lasers, and novel self-frequency-doubling laser materials. Key results have been development of encapsulated-rod concepts for diode-side-pumped lasers, demonstration of efficient all-solid-state visible lasers based on the self-frequency-doubling material Yb:YAB, and development of a new class of efficient visible sources based on intracavity, frequency-doubled crystalline Raman lasers.

Following approaches from Australian industry Prof Piper and his team have undertaken extensive research in high-precision ultra-violet laser micromachining of polymers, metals and ceramics using high-pulse-rate uv lasers. One key outcome of this work has been development of the laser drilling technology used to fabricate the micro-orifice flow controllers for the Sydney 2000 Olympic Games torches. This work has expanded to include laser fabrication of photonic components such as fibre Bragg gratings and other microstructured optical (nonlinear) materials.

2005

Sir Professor J (James) Fraser Stoddart, Saul Weinstein Professor of Organic Chemistry, Northwestern University

Host University University of Edinburgh

Awards & Prizes

2005 Fellowship of the American Association for the Advancement of Science, USA
2005 Honorary Doctor of Science Degree (University of Birmingham, UK)
2004 University of Edinburgh Alumnus of the Year 2005 Award
2004 Nagoya Gold Medal in Organic Chemistry
1999 Arthur C Cope Scholar Award (American Chemical Society)
1999 Fellowship of the German Academy (Leopoldina) of Natural Sciences
1994 Fellowship of the Royal Society of London, UK
1993 International Izatt-Christensen Award in Macrocyclic Chemistry

Profile/ Specialisms

The academic career of Fraser Stoddart can be traced through thick and thin from the Athens of the North to the Windy City beside Lake Michigan with interludes on the edge of the Canadian Shield beside Lake Ontario, in the Socialist Republic of South Yorkshire, on the Plains of Cheshire beside the Wirral, in the Midlands of the Heartland of Albion, and in the City of the Angels beside the Peaceful Sea. He has been a member of the faculty at Northwestern University since 2008. He is a Board of Trustees Professor and Director of the Center for the Chemistry of Integrated Systems. His research interests are in chemistry beyond the molecule, which, combined with his interest in templation, has led to the template-directed synthesis, based on molecular recognition and self-assembly processes, of a wide range of mechanically interlocked molecules, bistable variants of which have found their way in the form of switches into molecular electronic devices and drug delivery systems. In terms of molecular structure, his research straddles the size regime from the mesomolecular scale all the way up to the nanoscopic, microscopic and macroscopic levels: it includes wholly synthetic polymers and metal-organic frameworks. He also embraces radical chemistry in both the supramolecular and mechanostereochemical domains.

Stoddart is one of the few chemists of the past quarter of a century to have created a new field of organic chemistry — namely, one in which the mechanical bond is a pre-eminent feature of molecular compounds. He has pioneered the development of the use of molecular recognition and self-assembly processes in template-directed protocols for the syntheses of two-state mechanically interlocked compounds (bistable catenanes and rotaxanes) that have been employed as molecular switches and as motor-molecules in the fabrication of nanoelectronic devices and NanoElectroMechanical Systems (NEMS). His work has been recognized by many awards, including the Carbohydrate Chemistry Award of The Chemical Society (1978), the International Izatt-Christensen Award in Macrocyclic Chemistry (1993), the American Chemical Society's Cope Scholar Award (1999), the Nagoya Gold Medal in Organic Chemistry (2004), the King Faisal International Prize in Science (2007), the Tetrahedron Prize for Creativity in Organic Chemistry (2007), the Albert Einstein World Award of Science (2007), the Foresight Nanotech Institute Feynman Prize in Nanotechnology (Experimental) (2007), the American Chemical Society's Cope Award (2008), and the Royal Society's Davy Medal (2008). He was one of ca. 20 research scientists to be invited by the Royal Swedish Academy of Sciences to participate in the Nobel Jubilee Symposium on "Frontiers of Molecular Sciences" in Stockholm in December 2001.

In 2005, he received the Honorary Degree of Doctor of Science from Birmingham University, as well as being the recipient of the University of Edinburgh Alumnus of the Year 2005 Award. He received an Honorary Degree of Doctor of Science from the University of Twente (2006), Sheffield University (2008), Trinity College Dublin (2009),

and the University of St Andrews (2010). He is currently on the international advisory boards of numerous journals, including *Angewandte Chemie*, *Organic Letters*, and *Chemistry World*. He is editor-in-chief of *Applied Nanoscience*. He is a Fellow of the Royal Society (1994), the German Academy (Leopoldina) of Natural Sciences (1999), the American Association for the Advancement of Science (2005), the Science Division of the Royal Netherlands Academy of Arts and Sciences (2006), and the American Academy of Arts and Sciences (2012). He is an honorary fellow of the Royal Society of Edinburgh (2008) and the Royal Society of Chemistry (2011). He was appointed by Her Majesty Queen Elizabeth II as a Knight Bachelor in her 2007 New Year's Honours List for his services to chemistry and molecular nanotechnology. In 2010 he was the recipient of a Royal Medal, granted by Her Majesty Queen Elizabeth II, and presented by Prince Philip, Duke of Edinburgh, at the Royal Society of Edinburgh.

Professor Paul Bushkovitch, History, Yale University

Host University University of Aberdeen

Awards & Prizes Lewis Prize 1994, American Philosophical Society, for England and the North (jointly with Maija Jansson).

Profile/ Specialisms Paul Bushkovitch received his Ph.D. from Columbia University in 1975. He specializes in Russia before the eighteenth century. He is the author of *The Merchants of Moscow 1580-1650* (1980), *Religion and Society in Russia, the Sixteenth and Seventeenth Centuries* (1992), (with Maija Jansson and Nikolai Rogozhin) "England and the North: the Russian Embassy of 1613-1614," *Memoirs of the American Philosophical Society* 210 (1994), *Peter the Great* (2001), *Peter the Great: The Struggle for Power, 1671-1725* (2001), and *A Concise History of Russia*, Cambridge, 2012.

2004

Professor Kenton M Sanders, Physiology and Cell Biology, University of Nevada

Host University University of Strathclyde

Profile/ Specialisms I have been interested in smooth muscle physiology and pharmacology for most of my career. As a student, I became interested in electrical rhythmicity in smooth muscles, and I have devoted most of my efforts to trying to understand the mechanisms responsible for this activity. Like the heart, many smooth muscles have spontaneous rhythmicity. We now think that a special class of pacemaker cells, interstitial cells of Cajal (ICC), drives this activity in gastrointestinal smooth muscles and oviduct. I have collaborated with Drs. Sean Ward and Sang Don Koh for several years on the study of ICC. We have used electrophysiology, optical imaging techniques, molecular biology, confocal and electron microscopy, and several other techniques to study the structure and function of ICC. These cells are present in pacemaker areas of the GI tract and oviduct. ICC are excitable cells that are spontaneously active after they have been dispersed from intact muscles. We have made a transgenic mouse in which ICC are labeled with a fluorescent protein (copGFP). The rhythmicity of GI and oviduct muscles stops when ICC are damaged or lost. We are also studying the development of ICC and trying to understand what happens to these cells in certain types of GI motility disorders, such as the defects in motility that occurs in diabetes.

I've also been interested in neural control of smooth muscles. In the case of GI muscles important behaviors of intact organs and tissues are controlled by excitatory and

inhibitory motor neurons. We have spent considerable effort trying to understand how the transmitter substances released by neurons affects electrical rhythmicity, intracellular calcium transients, and contractions. We have studied the effects of nitric oxide (NO) broadly and characterized post-junctional responses and molecular regulation of ion channels in response to NO released from neurons. Recently we have also been working on the other major inhibitory neurotransmitter, a purine, which for many years has been thought to be ATP. We have recently reported that B-NAD is actually a better candidate for this transmitter as the effects of exogenous ATP do not mimic the effects of the substance released from neurons. We also now recognize that ICC are innervated and participate in neurotransmission in GI muscles. Thus, loss of these cells may reduce regulation of GI motility by excitatory and inhibitory nerves. Much of our work on the role of neurotransmitters has focused on how these substances affect the ionic conductances in smooth muscle cells or ICC that are responsible for electrical responses. We have used the patch clamp technique extensively for these studies and molecular techniques to attempt to understand the targets of neurotransmitter actions.

Professor Mario Livio, Head of the Science Division of the Space Telescope Science Institute USA

Host University University of St Andrews

Profile/ Specialisms Fellow American Association for the Advancement of Science
 Dr Mario Livio is a senior astrophysicist at the Hubble Space Telescope Science Institute. He joined the Institute in 1991 as head of the Archive Branch, and also served as the Head of the Institute's Science Division. Prior to coming to the Institute, he completed his undergraduate studies (majoring in physics and mathematics) at the Hebrew University in Jerusalem, his M.Sc. degree (in theoretical particle physics) at the Weizmann Institute, and his Ph.D. (in theoretical astrophysics) at Tel-Aviv University. He was a professor of physics in the physics department of the Technion-Israel Institute of Technology from 1981 until 1991.

Mario came to his career in physics via a long and winding path. As Mario himself writes: "I was born in 1945 in Romania. When I was a few months old, both my parents had to flee Romania for political reasons, and I was left with my grandparents until the age of 5. In 1950, most Romanian Jews were pressured to leave, and I immigrated with my grandparents to Israel."

A love for astrophysics somehow emerged and persisted, with a special interest in the accretion of mass by black holes, neutron stars, and white dwarfs. In the past decade, Mario focused particularly on the topics of supernova explosions and their use in cosmology to determine the rate of expansion of the Universe, on the nature of "dark energy", on the formation of black holes and the possibility to extract energy from them, on the formation of planets in disks around young stars, and on the emergence of intelligent life in the Universe. Mario has published over 400 scientific papers.

2003

Professor Tadashi Matsunaga, President of Tokyo University of Agriculture and Technology

Host University Heriot-Watt University

Awards & Prizes Dr. Matsunaga has been awarded several prizes for his research, including the 1994 Academic Award of the Chemical Society of Japan and the 2004 Prize of the Japanese

Society for Bioengineering and Bioscience. He also received an honorary degree of Doctor of Science from Heriot-Watt University in Edinburgh, the United Kingdom in 2003.

Profile/ Specialisms

Professor Matsunaga opened the door to the fabrication of biosensors to detect the external stimulus using biological reactions within cells by a technique that measures direct electron transfer between cells and electrodes. He has successfully constructed a practical on-line biosensing system for toxic chemicals, which are detected as signals derived from oxygen consumption of cells. He has also proposed using geomagnetic sensors in bacteria as novel materials for biotechnological applications. These materials are inspired from the biological sensor and fabricated through the synthetic bioengineering approach based on the whole genome information of the organism. This talk will present his pioneering biosensors using cells and next-generation materials built up by molecule complexes.

Because various biological reactions in all organisms can be electrochemically monitored and controlled, this field of research has promising potential for various applications in biomedical and industrial sectors. Tadashi Matsunaga has pioneered the technologies of microbial sterilization, on-line biosensor for toxicity monitoring, biomagnets, etc. Tadashi Matsunaga received his doctoral degree in biotechnology from Tokyo Institute of Technology in 1979. He then worked as a research associate in Miami (U.S.), returning to Japan to accept an Associate Professorship at Tokyo University of Agriculture and Technology (TUAT). Promoted to Full Professor in 1989, Prof. Matsunaga served as Dean of Engineering from 2001 to 2007, and as Trustee and Vice-President for Academic Affairs and Research from 2007 to 2011; he has served as President of TUAT since 2011.

2002

Professor Apostolos P Georgopoulos, Director Brains Sciences Center Minneapolis Veterans Medical Center

Host University University of Edinburgh

Profile/ Specialisms

Neuroscience; neurophysiology

Apostolos P. Georgopoulos studied Medicine and Physiology at the University of Athens in Greece where he obtained his M.D. and Ph.D. degrees. He was trained in neurophysiology by Vernon B. Mountcastle at Johns Hopkins and, after a brief return to Athens, he came back to Johns Hopkins. He ascended the faculty ranks and promoted to Professor of Neuroscience in 1986. He was a member of the Philip Bard Laboratories of Neurophysiology at the Department of Neuroscience until 1991 when he moved to Minnesota as the American Legion Brain Sciences Chair at the Minneapolis Veterans Affairs Medical Center and the University of Minnesota.

Professor Savio Woo, Distinguished University Professor and Director Musculoskeletal Research Center, University of Pittsburgh

Host University University of Aberdeen

Profile/ Specialisms

Dr. Savio L-Y. Woo is a Distinguished University Professor of Bioengineering and the Founder and Director of the Musculoskeletal Research Center (MSRC), a diverse multidisciplinary research and educational center in the Department of Bioengineering, Swanson School of Engineering at the University of Pittsburgh. He arrived at the University of Pittsburgh in 1990 after spending 20 years at the University of California, San Diego (UCSD) as a Professor of Surgery and Bioengineering.

Dr. Woo is a pioneer in bioengineering and is renowned for his 40+ years of translational research in healing and repair of tissues. Together with his team, they have authored 320 original research papers in refereed journals as well as 146 book chapters and review articles. Their work has significantly impacted the management of ligament and tendon injuries including clinical paradigm shifts that have led to improved patient outcome. More recently, Dr. Woo's research has focused on two areas: 1) measurement of the properties of ligaments and tendons and joint mechanics and 2) functional tissue engineering (FTE) and regeneration of ligaments and tendons. His laboratories are organized to investigate the cellular and molecular responses to mechanical stimuli to improve the outcome of ligament and tendon healing. Also, he has pioneered the use of robotic technology to study the function of ACL and to improve ACL reconstruction procedures. When combining it with biplanar fluoroscopy, he and his team will be able to better characterize mechanisms of ACL injury and find better ways for its prevention. Currently, Dr. Woo is exploring the use of biodegradable magnesium (Mg) and Mg alloys for ligament regeneration.

Dr. Woo has been a leader in Bioengineering and Orthopaedics. He has served as Chair of ASME's Bioengineering Division, United States National Committee of Biomechanics, and the World Council for Biomechanics as well as President for The Orthopaedic Research Society, American Society of Biomechanics, and International Society for Fracture Repair. He has also founded the International Symposium on Ligaments and Tendons (ISL&T) and World Association for Chinese Biomedical Engineers (WACBE).

Dr. Woo has been inducted into the Institute of Medicine, the National Academy of Engineering, and the Academia Sinica, only one of four persons who have gained all three of these honors.

He has also received the highest honors from many professional societies, including the Kappa Delta Award, the Herbert R. Lissner Medal, the O'Donoghue Sports Injury Research Award, the Giovanni Borelli Award, the Muybridge Medal, and the prestigious Diamond Award for Distinguish Achievement from the University of Washington, among others. Most recently, he was given the IEEE Gold Medal for Innovation in Healthcare Technology from the Institute for Electrical and Electronics Engineers. In 1998, Dr. Woo received the Olympic Prize for Sports Science from the International Olympic Committee and the first Olympic gold medal at the Nagano Games in Japan.

2001

Professor Thomas Franck, School of Law, New York University

Host University University of Glasgow

Awards & Prizes 1998-2000 President of the American Society of International Law
1982 and 1973 Guggenheim Fellowships

Profile/ Specialisms International Law, Guggenheim fellowship recipient; President American Association of International Law
Professor Thomas Franck was a legal adviser to many foreign governments; an ad hoc judge and advocate before the International Court of Justice; the author of many books on international law; and the founding director of the Center for International Studies at N.Y.U.

An advocate of decolonization in the 1950s and '60s, Professor Franck worked on constitutions for several African nations as they emerged from British rule: Tanganyika and Zanzibar, which became Tanzania; Rhodesia, now Zimbabwe; and Sierra Leone. Professor Franck later served as legal adviser to the governments of Kenya, Mauritius, the Solomon Islands, El Salvador and Chad.

From 1995 to 2007, he was counsel to Bosnia before the International Court of Justice in the case against Serbia concerning the July 1995 massacre of about 8,000 Bosnians in Srebrenica

Professor Franck's advocacy for international justice was rooted in his childhood experience as a refugee from Nazi Germany. Born in Berlin on July 14, 1931, he was the only child of Hugo and Ilse Franck. When he was 7, he and his family fled Germany just before Kristallnacht, the Nazi pogrom in November 1938. The family's application for visas to the United States was denied, but after six months in Switzerland they obtained visas for Canada and emigrated to Vancouver.

Professor Franck was the author or co-author of 31 books on a wide range of international issues. His 1986 book, "Judging the World Court" (The Twentieth Century Fund), made the case for a substantial role for international courts. In "Resignation in Protest" (Viking, 1975), a book he co-wrote, he addressed the tension between the politician's loyalty to a party and duty to the citizenry. His writings called for respect of international treaties like the Geneva Conventions and the Law of the Sea Treaty, which regulates peaceful and military use of the oceans.

He advised many states and played a role in numerous negotiations, including the early stages of what became the Law of the Sea Convention, the United Nations treaty, adopted in 1982, that sets a comprehensive set of rules for all uses of the oceans. In later years he became active in international litigation, which he always saw as a means to an end, using the language of law to resolve disputes. Tom advised Bosnia in its genocide case against Serbia at the international court of justice in The Hague from 1994 until the final judgment was given in 2007, and at the time of his death was leading Macedonia's effort to overturn Greece's objection to its membership of Nato.

His scholarship was prolific, including 31 books, from *Race and Nationalism* in 1960 to *The Law and Practice of the United Nations* in 2008. One regular visitor to the Greenwich Village townhouse that Tom shared with Martin Daley, his long-term partner, described shelves in the guest room there holding row upon row of books written by Tom, and his astonishment that quite so many could have been written by one person. These writings led to awards and distinctions and many foreign visits, including, as a visiting fellow, to Trinity College, Cambridge in 1996-97. His honorary degrees included one, especially valued, awarded in 2004 by the University of Glasgow, where Tom had close links and where, in 2001, he was Carnegie centenary visiting professor. He served as president of the American Society of International Law, and for many years was editor in chief of the *American Journal of International Law*.

He kept up to date with the political and ethical issues of the day, and was one of the few international lawyers in the US to challenge President Bush's administration from the outset, well before the images of abuse at Abu Ghraib encouraged others to join him. He actively supported Barack Obama's efforts to reconnect with the rule of law.

Professor Alain Aspect, Institut d'Optique, Orsay, France

Host University University of Strathclyde

Profile/ Specialisms

Optical physics and quantum mechanics

Alain Aspect is emeritus director of research at CNRS, Professor Chair Augustin Fresnel Optics Institute at the graduate school and professor at the Ecole Polytechnique.

Alain Aspect is an experimental physicist whose early work at the Institute of Optics, focused on quantum optics and the foundations of quantum mechanics. After contributing to the development of methods of laser cooling of atoms in the group of Claude Cohen-Tannoudji at Laboratoire Kastler Brossel ENS, he established the Institute of Optics group of active research quantum atom optics, and quantum simulators based on ultra-cold atoms.

Aspect is a graduate of the École Normale Supérieure de Cachan (ENS Cachan). He passed the 'agrégation' in physics in 1969 and received his master's degree from Université d'Orsay. He then did his national service, teaching for three years in Cameroon.

In the early 1980s, while working on his PhD thesis from the lesser academic rank of lecturer, he performed the elusive "Bell test experiments" that showed that Albert Einstein, Boris Podolsky and Nathan Rosen's *reductio ad absurdum* of quantum mechanics, namely that it implied 'ghostly action at a distance', did in fact appear to be realised when two particles were separated by an arbitrarily large distance (see EPR paradox). A correlation between their wave functions remained, as they were once part of the same wave-function that was not disturbed before one of the child particles was measured.

If quantum theory is correct, the determination of an axis direction for the polarization measurement of one photon, forcing the wave function to 'collapse' onto that axis, will influence the measurement of its twin. This influence occurs despite any experimenters not knowing which axes have been chosen by their distant colleagues, and at distances that disallow any communication between the two photons, even at the speed of light. Aspect's experiments were considered to provide overwhelming support to the thesis that Bell's inequalities are violated in its CHSH version. However, his results were not completely conclusive, since there were so-called loopholes that allowed for alternative explanations that comply with local realism. See local hidden variable theory.

Stated more simply, the experiment provides strong evidence that a quantum event at one location can affect an event at another location without any obvious mechanism for communication between the two locations. This has been called "spooky action at a distance" by Einstein (who doubted the physical reality of this effect). However, these experiments do not allow faster-than-light communication, as the events themselves appear to be inherently random.

After his works on Bell's inequalities, he turned toward studies of laser cooling of neutral atoms and is now mostly involved in Bose–Einstein condensates related experiments. Aspect was deputy director of the French "grande école" SupOptique until 1994. He is a member of the French Academy of Sciences and French Academy of Technologies, and professor at the École Polytechnique. In 2005 he was awarded the gold medal of the Centre national de la recherche scientifique, where he is currently Research Director. The 2010 Wolf Prize in physics was awarded to Aspect, Anton Zeilinger and John Clauser. October 7, 2013, Aspect was awarded the Danish Niels Bohr International Gold Medal. In 2013 he was also awarded the Balzan Prize for Quantum Information Processing and Communication.